

Regan Schutte

From: Semar, Donna [dsemar@kcwa.com]
Sent: Friday, December 07, 2007 3:00 PM
To: Jeane Hill; Regan Schutte; Sachi Itagaki
Subject: AB303 COST ESTIMATE
Follow Up Flag: Follow up
Flag Status: Completed
Attachments: CSJ Cost Estimate.xls

Attached is the original email sent from Kleinfelder with the cost estimates.

Donna Semar

Water Resources Planner

Kern County Water Agency

Improvement District No. 4

661-634-1466



From: Chris Johnson [mailto:CJohnson@kleinfelder.com]
Sent: Monday, June 26, 2006 12:58 PM
To: Semar, Donna; Varga, Martin; Vicky Sims
Subject: Draft Final spreadsheet for cost benefit analysis

Martin and Donna,

Please find attached the final draft spreadsheet. It includes a schedule for one (1) of the three-wells sites, and is based on my experience and limited to just the drilling. It does not include permitting, disposal, reporting, etc. I can prepare one of these, once I get a call back on disposal.

The labor costs are for KA to provide on-site "as needed" not full-time construction observation. I will provide the assumptions that go along with that estimate in my report, and I will submit a proposal for the costs soon.

I will have to include the low-carbon steel data in my next transmission. That will be to email you the draft report, which I am working on finishing today.

12/7/2007

Any questions, please call.

Chris

Christopher S. Johnson, PG, CHG
Principal Hydrogeologist
Director - Groundwater Services Program
Technical Resource Council

559.486.6281x226 direct
559.442./5081 facsimile
559.647.7193 cellular

KLEINFELDER
EXPECT MORE

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KCWA Monitoring Well Cost Assessment

Drilling and Well Material Costs

| Anticipated Well Depth | 250 | 500 | 700 |
|--|--------------|--------------|--------------|
| Direct Rotary Drilling/PVC Casing and Screen | \$48,217.00 | \$74,901.50 | \$95,766.50 |
| Direct Rotary Drilling/304 SS Casing and Screen | \$60,257.50 | \$98,757.50 | \$129,557.50 |
| Reverse Rotary Drilling/PVC Casing and Screen | \$94,637.50 | \$119,887.50 | \$140,087.50 |
| Reverse Rotary Drilling/304 SS Casing and Screen | \$112,307.50 | \$155,807.50 | \$190,607.50 |

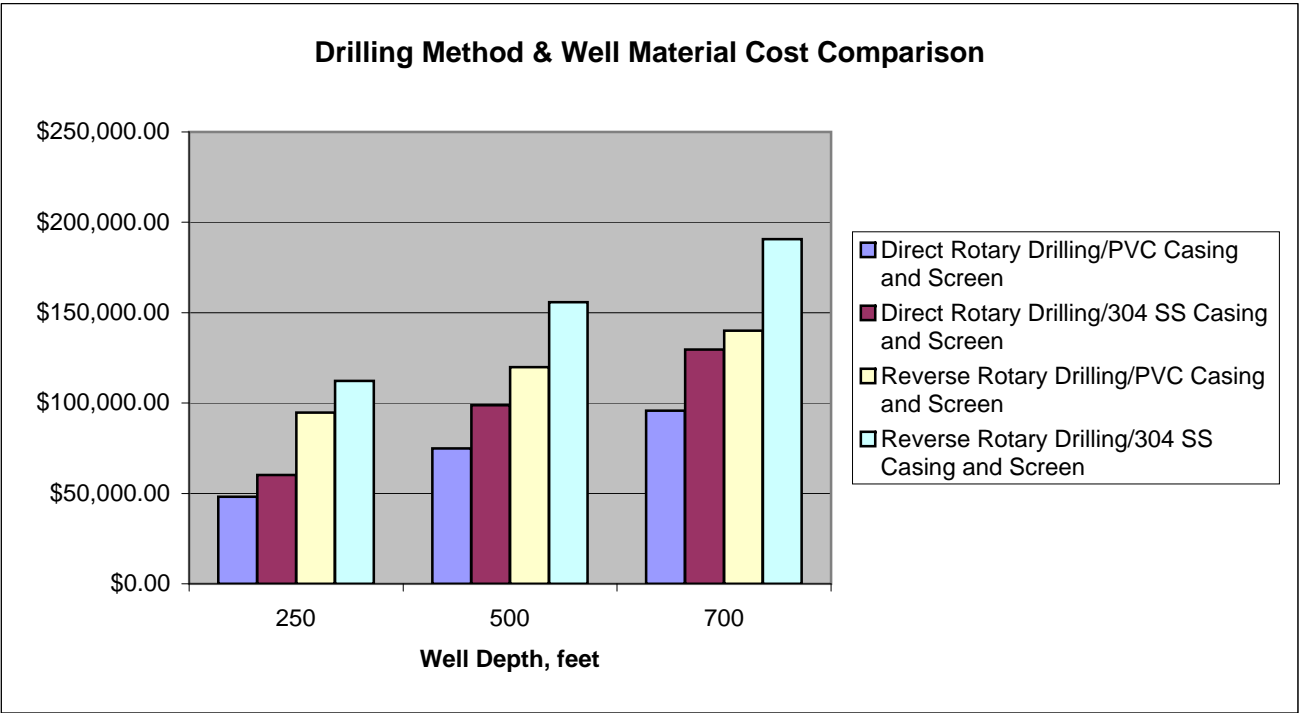
Estimated Construction Observation Costs

| | |
|--|----------|
| Design, Construction Observation, Hydrogeological Assistance | \$79,833 |
|--|----------|

Selected Drilling Method, Subtotal Costs

| | | | |
|--|--------------|--------------|--------------|
| Direct Rotary Drilling/PVC Casing and Screen - One 3 well site | \$218,885.00 | | |
| Direct Rotary Drilling/PVC Casing and Screen - 2 wells | \$96,434.00 | | |
| Direct Rotary Drilling/PVC Casing and Screen - 2 wells | | \$149,803.00 | |
| Direct Rotary Drilling/PVC Casing and Screen - 2 wells | | | \$191,533.00 |
| | | | |
| Direct Rotary Drilling/PVC Casing and Screen - Six (6) wells | \$437,770.00 | | |

| | |
|---------------|--------------|
| Project Total | \$517,602.89 |
|---------------|--------------|



Drilling - Direct Rotary - PVC

| 250 ft monitoring well | | | | |
|---------------------------------|-------------|----------|-------------|-------------|
| | Units | Est. Qty | Unit Price | Total |
| Mobilization | Each | 1 | \$11,000.00 | \$11,000.00 |
| Permits | Each | 2 | \$500.00 | \$1,000.00 |
| Test Hole | Linear Foot | 250 | \$69.00 | \$17,250.00 |
| Geophysical logging | Lump Sum | 1 | \$3,900.00 | \$3,900.00 |
| | | | | |
| F&I 6" nominal casing | Foot | 230 | \$16.80 | \$3,864.00 |
| F&I 6" nominal screen | Foot | 20 | \$91.00 | \$1,820.00 |
| F&I Filter Pack | Yard | 1 | \$430.00 | \$430.00 |
| Bentonite seals x 2/well | Foot | 20 | \$12.00 | \$240.00 |
| F&I Concrete sanitary seal | Yard | 9.08 | \$475.00 | \$4,313.00 |
| Air-lift development | Hour | 8 | \$200.00 | \$1,600.00 |
| Development Pump | Hour | 8 | \$200.00 | \$1,600.00 |
| | | | | |
| Concrete apron | Each | 1 | \$450.00 | \$450.00 |
| Standpipe Security and Bollards | Each | 1 | \$750.00 | \$750.00 |
| | | | | |
| Cuttings disposal | | | | |

| 500 ft monitoring well | | | | |
|---------------------------------|-------------|----------|-------------|-------------|
| | Units | Est. Qty | Unit Price | Total |
| Mobilization | Each | 1 | \$11,000.00 | \$11,000.00 |
| Permits | Each | 2 | \$500.00 | \$1,000.00 |
| Test Hole | Linear Foot | 500 | \$69.00 | \$34,500.00 |
| Geophysical logging | Lump Sum | 1 | \$3,900.00 | \$3,900.00 |
| | | | | |
| F&I 6" nominal casing | Foot | 480 | \$16.80 | \$8,064.00 |
| F&I 6" nominal screen | Foot | 20 | \$91.00 | \$1,820.00 |
| F&I Filter Pack | Yard | 1 | \$430.00 | \$430.00 |
| Bentonite seals x 2/well | Foot | 20 | \$12.00 | \$240.00 |
| F&I Concrete sanitary seal | Yard | 20.1 | \$475.00 | \$9,547.50 |
| Air-lift development | Hour | 8 | \$200.00 | \$1,600.00 |
| Development Pump | Hour | 8 | \$200.00 | \$1,600.00 |
| | | | | |
| Concrete apron | Each | 1 | \$450.00 | \$450.00 |
| Standpipe Security and Bollards | Each | 1 | \$750.00 | \$750.00 |
| | | | | |
| Cuttings disposal | | | | |

| 700 ft monitoring well | | | | |
|---------------------------------|-------------|----------|-------------|-------------|
| | Units | Est. Qty | Unit Price | Total |
| Mobilization | Each | 1 | \$11,000.00 | \$11,000.00 |
| Permits | Each | 2 | \$500.00 | \$1,000.00 |
| Test Hole | Linear Foot | 700 | \$69.00 | \$48,300.00 |
| Geophysical logging | Lump Sum | 1 | \$3,900.00 | \$3,900.00 |
| | | | | |
| F&I 6" nominal casing | Foot | 680 | \$16.80 | \$11,424.00 |
| F&I 6" nominal screen | Foot | 20 | \$91.00 | \$1,820.00 |
| F&I Filter Pack | Yard | 1 | \$430.00 | \$430.00 |
| Bentonite seals x 2/well | Foot | 20 | \$12.00 | \$240.00 |
| F&I Concrete sanitary seal | Yard | 27.9 | \$475.00 | \$13,252.50 |
| Air-lift development | Hour | 8 | \$200.00 | \$1,600.00 |
| Development Pump | Hour | 8 | \$200.00 | \$1,600.00 |
| | | | | |
| Concrete apron | Each | 1 | \$450.00 | \$450.00 |
| Standpipe Security and Bollards | Each | 1 | \$750.00 | \$750.00 |
| | | | | |
| Cuttings disposal | | | | |

Subtotal

48,217

74,902

95,767

Cummulative Total
Contingency
Engineering & Legal

218,885
10,944
17,511

247,340

Total Rounded \$250,000

Drilling - Reverse Rotary - PVC

| 250 ft monitoring well | | | | |
|---------------------------------|-------------|----------|-------------|-------------|
| | Units | Est. Qty | Unit Price | Total |
| Mobilization | Each | 1 | \$45,000.00 | \$45,000.00 |
| Permits | Each | 2 | \$500.00 | \$1,000.00 |
| Conductor casing | Linear Foot | 50 | \$350.00 | \$17,500.00 |
| Test Hole | Linear Foot | 200 | \$89.00 | \$17,800.00 |
| Geophysical logging | Lump Sum | 1 | \$3,900.00 | \$3,900.00 |
| | | | | |
| F&I 6" nominal casing | Foot | 230 | \$12.00 | \$2,760.00 |
| F&I 6" nominal screen | Foot | 20 | \$21.00 | \$420.00 |
| F&I Filter Pack | Yard | 1 | \$430.00 | \$430.00 |
| Bentonite seals x 2/well | Foot | 20 | \$12.00 | \$240.00 |
| F&I Concrete sanitary seal | Yard | 2.5 | \$475.00 | \$1,187.50 |
| Air-lift development | Hour | 8 | \$200.00 | \$1,600.00 |
| Development Pump | Hour | 8 | \$200.00 | \$1,600.00 |
| | | | | \$0.00 |
| Concrete apron | Each | 1 | \$450.00 | \$450.00 |
| Standpipe Security and Bollards | Each | 1 | \$750.00 | \$750.00 |
| | | | | |
| Cuttings disposal | | | | |

| 500 ft monitoring well | | | | |
|------------------------|-------------|----------|-------------|-------------|
| | Units | Est. Qty | Unit Price | Total |
| Mobilization | Each | 1 | \$45,000.00 | \$45,000.00 |
| Permits | Each | 2 | \$500.00 | \$1,000.00 |
| Linear foot | Linear foot | 50 | \$350.00 | \$17,500.00 |
| Linear Foot | Linear Foot | 450 | \$89.00 | \$40,050.00 |
| Lump Sum | Lump Sum | 1 | \$3,900.00 | \$3,900.00 |
| | | | | |
| Foot | Foot | 480 | \$12.00 | \$5,760.00 |
| Foot | Foot | 20 | \$21.00 | \$420.00 |
| Yard | Yard | 1 | \$430.00 | \$430.00 |
| Foot | Foot | 20 | \$12.00 | \$240.00 |
| Yard | Yard | 2.5 | \$475.00 | \$1,187.50 |
| Hour | Hour | 8 | \$200.00 | \$1,600.00 |
| Hour | Hour | 8 | \$200.00 | \$1,600.00 |
| | | | | \$0.00 |
| Each | Each | 1 | \$450.00 | \$450.00 |
| Each | Each | 1 | \$750.00 | \$750.00 |

| 700 ft monitoring well | | | | |
|------------------------|-------------|----------|-------------|-------------|
| | Units | Est. Qty | Unit Price | Total |
| Mobilization | Each | 1 | \$45,000.00 | \$45,000.00 |
| Permits | Each | 2 | \$500.00 | \$1,000.00 |
| Linear foot | Linear foot | 50 | \$350.00 | \$17,500.00 |
| Linear Foot | Linear Foot | 650 | \$89.00 | \$57,850.00 |
| Lump Sum | Lump Sum | 1 | \$3,900.00 | \$3,900.00 |
| | | | | |
| Foot | Foot | 680 | \$12.00 | \$8,160.00 |
| Foot | Foot | 20 | \$21.00 | \$420.00 |
| Yard | Yard | 1 | \$430.00 | \$430.00 |
| Foot | Foot | 20 | \$12.00 | \$240.00 |
| Yard | Yard | 2.5 | \$475.00 | \$1,187.50 |
| Hour | Hour | 8 | \$200.00 | \$1,600.00 |
| Hour | Hour | 8 | \$200.00 | \$1,600.00 |
| | | | | \$0.00 |
| Each | Each | 1 | \$450.00 | \$450.00 |
| Each | Each | 1 | \$750.00 | \$750.00 |

TOTAL

\$94,637.50

\$119,887.50

\$140,087.50

Drilling - Direct Rotary - 304SS

| 250 ft monitoring well | | | | |
|---------------------------------|-------------|----------|-------------|-------------|
| | Units | Est. Qty | Unit Price | Total |
| Mobilization | Each | 1 | \$11,000.00 | \$11,000.00 |
| Permits | Each | 2 | \$500.00 | \$1,000.00 |
| Test Hole | Linear Foot | 250 | \$69.00 | \$17,250.00 |
| Geophysical logging | Lump Sum | 1 | \$3,900.00 | \$3,900.00 |
| | | | | |
| F&I 6" nominal casing | Foot | 230 | \$85.00 | \$19,550.00 |
| F&I 6" nominal screen | Foot | 20 | \$65.00 | \$1,300.00 |
| F&I Filter Pack | Yard | 1 | \$430.00 | \$430.00 |
| Bentonite seals x 2/well | Foot | 20 | \$12.00 | \$240.00 |
| F&I Concrete sanitary seal | Yard | 2.5 | \$475.00 | \$1,187.50 |
| Air-lift development | Hour | 8 | \$200.00 | \$1,600.00 |
| Development Pump | Hour | 8 | \$200.00 | \$1,600.00 |
| | | | | |
| Concrete apron | Each | 1 | \$450.00 | \$450.00 |
| Standpipe Security and Bollards | Each | 1 | \$750.00 | \$750.00 |
| | | | | |
| Cuttings disposal | | | | |

| 500 ft monitoring well | | | | |
|---------------------------------|-------------|----------|-------------|-------------|
| | Units | Est. Qty | Unit Price | Total |
| Mobilization | Each | 1 | \$11,000.00 | \$11,000.00 |
| Permits | Each | 2 | \$500.00 | \$1,000.00 |
| Test Hole | Linear Foot | 500 | \$69.00 | \$34,500.00 |
| Geophysical logging | Lump Sum | 1 | \$3,900.00 | \$3,900.00 |
| | | | | |
| F&I 6" nominal casing | Foot | 480 | \$85.00 | \$40,800.00 |
| F&I 6" nominal screen | Foot | 20 | \$65.00 | \$1,300.00 |
| F&I Filter Pack | Yard | 1 | \$430.00 | \$430.00 |
| Bentonite seals x 2/well | Foot | 20 | \$12.00 | \$240.00 |
| F&I Concrete sanitary seal | Yard | 2.5 | \$475.00 | \$1,187.50 |
| Air-lift development | Hour | 8 | \$200.00 | \$1,600.00 |
| Development Pump | Hour | 8 | \$200.00 | \$1,600.00 |
| | | | | |
| Concrete apron | Each | 1 | \$450.00 | \$450.00 |
| Standpipe Security and Bollards | Each | 1 | \$750.00 | \$750.00 |
| | | | | |
| Cuttings disposal | | | | |

| 700 ft monitoring well | | | | |
|---------------------------------|-------------|----------|-------------|-------------|
| | Units | Est. Qty | Unit Price | Total |
| Mobilization | Each | 1 | \$11,000.00 | \$11,000.00 |
| Permits | Each | 2 | \$500.00 | \$1,000.00 |
| Test Hole | Linear Foot | 700 | \$69.00 | \$48,300.00 |
| Geophysical logging | Lump Sum | 1 | \$3,900.00 | \$3,900.00 |
| | | | | |
| F&I 6" nominal casing | Foot | 680 | \$85.00 | \$57,800.00 |
| F&I 6" nominal screen | Foot | 20 | \$65.00 | \$1,300.00 |
| F&I Filter Pack | Yard | 1 | \$430.00 | \$430.00 |
| Bentonite seals x 2/well | Foot | 20 | \$12.00 | \$240.00 |
| F&I Concrete sanitary seal | Yard | 2.5 | \$475.00 | \$1,187.50 |
| Air-lift development | Hour | 8 | \$200.00 | \$1,600.00 |
| Development Pump | Hour | 8 | \$200.00 | \$1,600.00 |
| | | | | |
| Concrete apron | Each | 1 | \$450.00 | \$450.00 |
| Standpipe Security and Bollards | Each | 1 | \$750.00 | \$750.00 |
| | | | | |
| Cuttings disposal | | | | |

TOTAL

\$60,257.50

\$98,757.50

\$129,557.50

Drilling - Reverse Rotary - 304SS

| 250 ft monitoring well | | | | | 500 ft monitoring well | | | | | 700 ft monitoring well | | | | |
|---------------------------------|-------------|----------|-------------|-------------|------------------------|-------------|----------|-------------|-------------|------------------------|-------------|----------|-------------|-------------|
| | Units | Est. Qty | Unit Price | Total | | Units | Est. Qty | Unit Price | Total | | Units | Est. Qty | Unit Price | Total |
| Mobilization | Each | 1 | \$45,000.00 | \$45,000.00 | | Each | 1 | \$45,000.00 | \$45,000.00 | | Each | 1 | \$45,000.00 | \$45,000.00 |
| Permits | Each | 2 | \$500.00 | \$1,000.00 | | Each | 2 | \$500.00 | \$1,000.00 | | Each | 2 | \$500.00 | \$1,000.00 |
| Conductor casing | Linear Foot | 50 | \$350.00 | \$17,500.00 | | Linear foot | 50 | \$350.00 | \$17,500.00 | | Linear foot | 50 | \$350.00 | \$17,500.00 |
| Test Hole | Linear Foot | 200 | \$89.00 | \$17,800.00 | | Linear Foot | 450 | \$89.00 | \$40,050.00 | | Linear Foot | 650 | \$89.00 | \$57,850.00 |
| Geophysical logging | Lump Sum | 1 | \$3,900.00 | \$3,900.00 | | Lump Sum | 1 | \$3,900.00 | \$3,900.00 | | Lump Sum | 1 | \$3,900.00 | \$3,900.00 |
| | | | | | | | | | | | | | | |
| F&I 6" nominal casing | Foot | 230 | \$85.00 | \$19,550.00 | | Foot | 480 | \$85.00 | \$40,800.00 | | Foot | 680 | \$85.00 | \$57,800.00 |
| F&I 6" nominal screen | Foot | 20 | \$65.00 | \$1,300.00 | | Foot | 20 | \$65.00 | \$1,300.00 | | Foot | 20 | \$65.00 | \$1,300.00 |
| F&I Filter Pack | Yard | 1 | \$430.00 | \$430.00 | | Yard | 1 | \$430.00 | \$430.00 | | Yard | 1 | \$430.00 | \$430.00 |
| Bentonite seals x 2/well | Foot | 20 | \$12.00 | \$240.00 | | Foot | 20 | \$12.00 | \$240.00 | | Foot | 20 | \$12.00 | \$240.00 |
| F&I Concrete sanitary seal | Yard | 2.5 | \$475.00 | \$1,187.50 | | Yard | 2.5 | \$475.00 | \$1,187.50 | | Yard | 2.5 | \$475.00 | \$1,187.50 |
| Air-lift development | Hour | 8 | \$200.00 | \$1,600.00 | | Hour | 8 | \$200.00 | \$1,600.00 | | Hour | 8 | \$200.00 | \$1,600.00 |
| Development Pump | Hour | 8 | \$200.00 | \$1,600.00 | | Hour | 8 | \$200.00 | \$1,600.00 | | Hour | 8 | \$200.00 | \$1,600.00 |
| | | | | \$0.00 | | | | | \$0.00 | | | | | \$0.00 |
| Concrete apron | Each | 1 | \$450.00 | \$450.00 | | Each | 1 | \$450.00 | \$450.00 | | Each | 1 | \$450.00 | \$450.00 |
| Standpipe Security and Bollards | Each | 1 | \$750.00 | \$750.00 | | Each | 1 | \$750.00 | \$750.00 | | Each | 1 | \$750.00 | \$750.00 |
| | | | | | | | | | | | | | | |
| Cuttings disposal | | | | | | | | | | | | | | |

TOTAL

\$112,307.50

\$155,807.50

\$190,607.50

PN:

GW74

PROFESSIONAL SERVICES

| Task | Admin | Drafting | Principal Professional | Project Professional | Staff Professional | Staff Professional | Task Totals |
|-------------------------------|----------|----------|------------------------|----------------------|--------------------|--------------------|-------------|
| Chargeable Rate per Hour | 86 | 98 | 200 | 167 | 144 | | |
| Specifications | 8 | 3 | 4 | 5 | 6 | | \$3,481 |
| Bidding and Pre-Construction | 0 | 0 | 6 | 4 | 0 | | \$1,868 |
| Site Preparation & Rig Set-Up | 0 | 0 | 0 | 4 | 8 | | \$1,820 |
| Well Siting | 0 | 0 | 0 | 4 | 8 | | \$1,820 |
| Conductor Casing Installation | 0 | 0 | 0 | 0 | 0 | | \$0 |
| Pilot Hole Drilling | 0 | 0 | 8 | 16 | 22 | | \$7,440 |
| Geophysical Logging | 0 | 0 | 6 | 6 | 8 | | \$3,354 |
| Sidewall Sampling | 0 | 0 | 0 | 0 | 0 | | \$0 |
| Zone Sampling | 0 | 0 | 0 | 0 | 0 | | \$0 |
| Well Design | 0 | 0 | 4 | 8 | 10 | | \$3,576 |
| Material Inventory | 0 | 0 | 0 | 0 | 0 | | \$0 |
| Well Installation | 0 | 0 | 12 | 32 | 120 | | \$25,024 |
| Development | 0 | 0 | 4 | 8 | 24 | | \$5,592 |
| Pump Placement | 0 | 0 | 0 | 0 | 0 | | \$0 |
| Pumping Tests | 0 | 0 | 0 | 0 | 0 | | \$0 |
| Well Rehabilitation | 0 | 0 | 0 | 0 | 0 | | \$0 |
| Downhole Video Survey | 0 | 0 | 0 | 0 | 0 | | \$0 |
| Well Brushing/Bailing | 0 | 0 | 0 | 0 | 0 | | \$0 |
| Acid Mixing/Application | 0 | 0 | 0 | 0 | 0 | | \$0 |
| Pumping Tests | 0 | 0 | 0 | 0 | 0 | | \$0 |
| Report | 32 | 24 | 8 | 24 | 48 | | \$17,624 |
| Subtotal Hours | 40 | 27 | 52 | 111 | 254 | 0 | 484 |
| Subtotal Cost by Position | \$3,440 | \$2,646 | \$10,400 | \$18,537 | \$36,576 | \$0 | \$71,599 |
| Subtotal Professional Costs | \$71,599 | | | | | | \$71,599 |

| | |
|-------------------------------|-----------------|
| Professional Services | \$71,599 |
| Project Management (5%) | \$3,580 |
| Accounting (1.5%) | \$1,074 |
| QA/QC & Contingency (5%) | \$3,580 |
| Total Professional Costs | \$79,833 |
| Drilling Contractor | \$0 |
| Analytical Services | \$0 |
| Pump Contractor | \$0 |
| Surveying Services | \$0 |
| Subtotal Contract Services | \$0 |
| Mark-Up (10%) | \$0 |
| Total Contract Services | \$0 |
| Estimated Project Cost | \$79,833 |



July 10, 2006
File No.: 72880

Kern County Water Agency
3200 Rio Mirada Drive
Bakersfield, California 93308

Attention: Mr. Martin Varga
Assistant ID4 Manager

Mr. Varga,

We are pleased to present our cost-benefit assessment relative to drilling operations and materials selection for new monitoring well construction in Bakersfield, in support of the Kern County Water Agency (KCWA) on-going groundwater elevation monitoring programs. The next step in our scope of service is to prepare and submit technical specifications for the drilling and completion of the planned monitoring wells. We will also be submitting a proposal to provide construction observation services related to the installation of these new wells.

Introduction

An expansion of both residential and commercial land use in Bakersfield has resulted in the loss of several wells historically used for groundwater elevation monitoring. As such, KCWA intends to replace some of these wells, with new, modern groundwater monitoring wells.

Purpose and Objectives

The historically monitored wells have included agricultural wells, domestic and public water supply wells. Our project purpose was to assess the costs and benefits related to replacing these former wells with new, smaller diameter wells whose sole

objective will be for groundwater elevation monitoring, and occasionally groundwater quality testing. As such, both the drilling method and materials used for these new monitoring wells needed to be assessed, relative to the intended use of the wells.

The cost-benefit goal is to provide a recommendation to the Kern County Water Agency regarding drilling method, well casing and screen material, and related issues regarding the installation of the new monitoring wells. The objectives of the cost-benefit analysis are 1) a comparison of methods and means relative to costs for installation, 2) the benefits of each method of installation and completion of the wells, and 3) a cross-comparison to assess and contrast the costs and benefits.

Scope of Services

Our scope of services includes submitting a cost-benefit assessment of drilling methods and well materials, along with the submission of technical specifications for the drilling and construction of the new wells, and the materials used in the completion of these new wells. This report presents and discusses the findings of the cost-benefit assessment.

Kleinfelder requested estimates from two drilling contractors for the purpose of assessing costs related to the potential installation of new monitoring wells in Kern county, specifically for the purpose of supporting KCWA groundwater elevation monitoring. In our discussions, we agreed that the most efficacious method would be to install each well separately, rather than in nested arrangements or in clusters; and we agreed that we would compare both direct-rotary against reverse-rotary drilling methods. These conditions were communicated to the contacted drilling contractors.

Appendix A contains a copy of the Preliminary Cost Estimate (PCE) form sent to Water Development Corporation (WDC) of Woodland, California; and Layne-Christensen (Layne) of Fontana, California. Kleinfelder received an estimated cost from WDC, but did not receive an estimate from Layne.

The following parameters generally describe the anticipated well installation, and were established for comparative estimating purposes only:

The anticipated completion depths, and more specifically the size and weight of the well casing and screen materials, will most likely call for drilling rigs of roughly equal size. If there is a discrepancy, then the reverse-rotary drilling equipment will be larger. In addition, the amount of ancillary support equipment (e.g. above-ground drilling fluid pits, air compressors, etc.) will be greater for the reverse-rotary drilling

program. Finally, the quantity of water required to support the reverse-rotary drilling operations (up to 200 gallons per minute) is far greater than that necessary for the direct-rotary operations.

The direct-rotary drilling equipment should be more mobile, less invasive to the well site, require less ancillary equipment and support, such as large supplies of readily available water.

The direct-rotary drilling method can provide for the minimum to preferred borehole diameter (10 to 12 inches); whereas, in general, the smallest diameter of reverse-rotary equipment commonly available is fourteen (14) inches.

Direct-rotary drilling operations will occupy significantly less space, and potentially have easier access to drilling site, compared to the reverse-rotary equipment. As such, replacing wells in urban areas or along active roadways will be easier utilizing direct-rotary drilling equipment.

Appendix B contains a hard copy of the accompanying electronic spreadsheet, constructed for the purposes of comparing costs between drilling methods, and well construction materials. The spreadsheet is not comprehensive, but illustrative of the key operations, components and materials required for the completion of the wells.

In general, direct-rotary drilling is clearly the more economical means of installing the new monitoring wells. It should be noted that we have not attempted to factor into the costs such things as market volatility with respect to fuel costs, nor the availability of the drilling contractors to begin work.

Materials Selection

Groundwater monitoring wells are normally constructed of polyvinyl chloride (PVC), stainless steel or Teflon. In this instance, since the objective of these wells is groundwater elevation monitoring, resistance to chemical attack is of far lesser

importance. Of importance for the well casing and screen material is resistance to collapse, and longevity.

In general, casing collapse occurs when the difference between the pumping water level in the well and the static water level outside the well exceeds the strength of the material to resist the lateral, or collapse, pressures exerted as a result of the difference in water levels. Specifically, the difference in water levels can be expressed as a pressure, in units of pounds per square foot. The collapse resistance of both PVC and stainless steel well casing and screen is widely published and can be used to select the appropriate casing and screen configuration for a given depth.

Well casing and screen are specified based upon a diameter and a "wall thickness", or how thick the side of the pipe must be to achieve sufficient collapse resistance. Using the six (6) inch diameter well casing size, an anticipated static water level of 100 feet, and a maximum drawdown in the well during pumping of 300 feet, we would anticipate a pressure differential of about 200 feet or about 87 pounds per square inch (PSI). This will require a minimum wall thickness equivalent to a Schedule 40 (0.280 inches) PVC. Stainless steel, Grade 304, is commercially available at a wall thickness of about 0.25 inches.

At the anticipated completion depths, schedule 40 PVC may not have sufficient rigidity to maintain the necessary alignment, even with the use of centralizers. As such, if PVC were selected, then a thicker casing and screen wall would be called for, such as Schedule 80 pipe (0.432 inches). Schedule 80 PVC casing should supply both the collapse resistance and rigidity to meet the installation requirements for the new wells.

Beyond the issue of collapse strength, is the concern for durability, or longevity. There is little to no data regarding the relative advantage of PVC versus stainless steel regarding operational lifetime. Our experience is that either of these materials would have a sufficient operation lifetime, and that if one was superior, then the

stainless steel, by virtue of the greater collapse resistance would have the perceived edge.

In the event, however unlikely, that a repair was necessary to the well casing, then stainless steel would be easier to repair; however, not at the anticipated diameters. Finally, cleaning of the well screen, with either mechanical equipment, chemicals or both, would work best on the stainless steel well screen, which would have a greater resistance to mechanical abrasion, and chemical cleaning.

Appendix B contains a hard copy of the accompanying electronic spreadsheet, constructed for the purposes of comparing costs between drilling methods, and well construction materials. The spreadsheet is not comprehensive, but illustrative of the key operations, components and materials required for the completion of the wells.

In general, the use of polyvinyl chloride well casing and screen is clearly the more economical choice for well casing and screen material. It should be noted that some economy of scale, relative to the cost of the materials, would be gained by making larger footage orders for materials, specifically well casing.

Discussion of Findings and Conclusions

The following is a discussion of our findings, and conclusions based upon those findings.

- **Drilling Method Comparisons.** Reverse-rotary drilling, in theory, will produce a relatively “cleaner” borehole, because of the nature of the drilling fluid circulation, and the composition of the drilling fluid used in drilling with this method. This can translate to a reduction in development time, and potentially greater hydraulic connectivity with the aquifer. However, reverse-rotary drilling operations need more equipment, occupy larger areas for operations (up to ½ acre in some cases), generate significantly greater quantities of drilling debris needing disposal, and require access to large quantities of drilling make-up water (40-100 gallons per minute is typical). Direct-rotary drilling would require additional development

time to clear the screened interval of residual drilling fluid, and could require the use of drilling fluid dispersants (generally non-phosphatic polymer-based). Direct-rotary drilling operations require less equipment, smaller operating areas, generate smaller quantities of drilling debris, and require far less make-up water.

- Drilling Costs. Direct-rotary drilling is less expensive than reverse-rotary drilling, in some cases by as much as 50% less. This is most likely because of the need for conductor casing in the reverse-rotary drilling operations, the greater equipment needs and as such the higher mobilization costs, and finally a slightly greater cost per drilled foot. This can clearly be seen in the costs presented in the spreadsheet, presented in Appendix B.
- Materials Comparison. Although stainless steel offers an apparent advantage in both longevity and resistance to collapse over PVC, for the anticipated applications PVC casing should be sufficient. It will be necessary to obtain PVC that has sufficient thread design and strength to remain connected during installation.
- Material Costs. The PVC material is significantly less costly than the Grade 304 stainless steel. The relative costs will remain the same (about 5 to 7 times greater cost per foot for the 304 than for the PVC) regardless of the well diameter, up to about 8 inches. The ancillary materials (filter pack, concrete, bentonite) will remain the same on a unit-price basis, regardless of the type of well casing and screen material selected. The significant materials factors are 1) diameter, 2) composition (i.e. PVC versus 304 stainless steel), and 3) joining method, i.e. threaded or welded. Please note that threaded connections are generally less prone to inducing mis-alignments in the casing, they are also more costly. Welded joints take longer to complete and are more prone to mis-alignment (requiring additional measures to ensure proper alignment), however they are less expensive in general. These costs are presented in Appendix B.

Recommendations

The following are our recommendations relative to drilling methods and material selections, for the installation of the new monitoring wells:

- Direct-rotary drilling. We are recommending this method for drilling the boreholes in which the wells will be installed. There will be a need to conduct more development, possibly including the use of polymer-based dispersants.
- Hybrid well casing and screen. We are recommending, depth allowing, a hybrid of PVC well casing and 304 stainless steel well screen. This should provide an adequate well, with a screen that can be cleaned if necessary.
- Casing/Screen Diameter. We recommend that the minimum diameter of casing and screen be four (4) inches, but six (6) inches will facilitate pumps that are more cost effective for temporary sampling operations

Limitations

Our discussion, conclusions and recommendations presented in this report are based upon the following:

- Our understanding of KCWA requirements for new monitoring well installation.
- Cost estimates provided by Water Development Corporation.
- Standard monitoring well installation practice.

Kleinfelder performed this work and prepared this report in accordance with the generally accepted standards of practice that exist in Kern County at this time. It should be recognized that the definition and evaluation of subsurface geologic conditions is a difficult and inexact art. Judgments leading to conclusions and recommendations are generally made with an incomplete knowledge of the subsurface conditions present. It is possible that variations in subsurface conditions could exist beyond the points explored in our assessment. Also, changes in

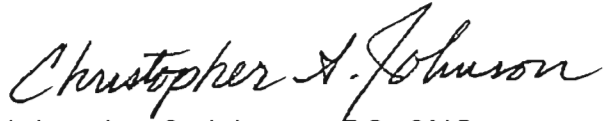
conditions could occur some time in the future due to variations in rain fall, temperature, regional water usage, or other factors.

The services provided by Kleinfelder were conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in California. As such, no warranty, expressed or implied, is made.

Respectfully submitted,
KLEINFELDER, INC.

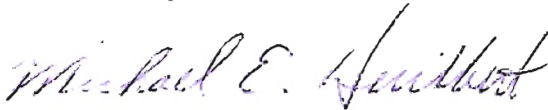


Vicky Sims
Staff Geologist



Christopher S. Johnson, PG, CHG
Principal Hydrogeologist
Groundwater Services Program Director

Reviewed by:



Michael E. Guilbert, PG
Groundwater Services Program

Appendices

APPENDIX A

November 1, 2005
File No.: GW23

Mr. Tim Parks
Layne Christensen Company
P.O. Box 1326
275 County Road 98
Woodland, California 95695
Phone: (530) 662-2825
Fax: (530) 662-2896

**Subject: Request for Preliminary Cost Estimate
Monitoring Well Drilling and Installation
Bakersfield, California**

Mr. Parks:

Per the request of our client, Kleinfelder is requesting a preliminary cost estimate (PCE) from Layne Christensen Company for the attached revised scope of work related to the Bakersfield, California project.

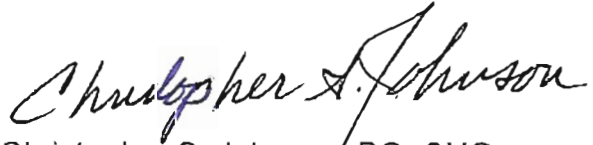
Attached is a brief description of the project specifics. Our client would like to get started as soon as possible. Therefore, we would like to know your next anticipated opening to schedule this work.

If you have any questions, please contact us immediately.

Respectfully,
KLEINFELDER, INC.



Vicky Sims,
Staff Geologist



Christopher S. Johnson, PG, CHG
Principal Hydrogeologist
Groundwater Services Program Director

DSW:lp

Attachment

November 1, 2005
File No.: GW23

Dean Williams
WDC Northern California District
P.O. Box 141-9580, County Road 93B
Zamora, California 95698
Phone: (800) 873-3073

**Subject: Request for Preliminary Cost Estimate
Monitoring Well Drilling and Installation
Bakersfield, California**

Mr. Parks:

Per the request of our client, Kleinfelder is requesting a preliminary cost estimate (PCE) from Water Development Corporation for the attached revised scope of work related to the Bakersfield, California project.

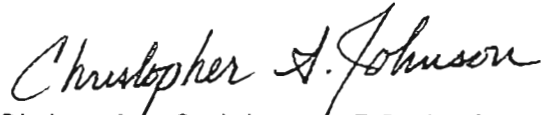
Attached is a brief description of the project specifics. Our client would like to get started as soon as possible. Therefore, we would like to know your next anticipated opening to schedule this work.

If you have any questions, please contact us immediately.

Respectfully,
KLEINFELDER, INC.



Vicky Sims,
Staff Geologist



Christopher S. Johnson, PG, CHG
Principal Hydrogeologist
Groundwater Services Program Director

DSW:lp

Attachment

Request for Preliminary Cost Estimate Monitoring Well Drilling and Installation Bakersfield, California

Kleinfelder, on behalf of our client, is requesting a preliminary cost estimate for the drilling and installation of two sets of three monitoring wells (six wells total) in Bakersfield, California. Each set of three wells will be comprised of a 250, 500 and 700 foot deep well, individually completed (i.e. one well per borehole). The primary purpose of these new wells is routine measurement of groundwater elevation. There is also the possibility that groundwater samples may be collected from these wells.

In general, we are asking for estimates for both direct and reverse-rotary drilled wells, and for estimates using either polyvinyl chloride (PVC) or 304 stainless steel casing and screen; or possibly a hybrid of the two materials (e.g. PVC casing and stainless steel screen).

Accompanying this request is an Excel spreadsheet which presents these various options. Along with your company's normal bid, please take the time to insert your costs, etc. into these attached spreadsheets. In addition, please list any and all assumptions you may have for the work, along with making suggestions appropriate to the completion of the project.

The following are project key points:

- Complete six (6) inch nominal diameter wells to depths of approximately 250, 500 and 700 feet below grade. Two sites with three wells at each site are anticipated.
- Drilling will be by either direct or reverse rotary method. Contractor to plan on additional development effort, including using chemical dispersant, in the screened zone of each well.
- Fully develop each well, along with completions of bollards and surface standpipe security wellheads.
- Full specifications will be released at a future time. The purpose of this preliminary cost estimate is for comparison purposes only.

Our requested scope of services for the project will include, but not be limited to, the following key features.

- Permitting with all applicable agencies.
- Drilling locations may be in urban areas, possibly requiring sound barriers, security fencing and traffic control. These parameters are not part of this estimate, but will be included in the actual bid documents.
- Drilling operations. Direct or reverse rotary will require tanks of necessary size. Contractor may assume that water is available within reasonable distance from each site, or on-site. Contractor should assume that a charge will be required for consumed water, and that make-up will need to be chemically tested prior to use. Standard drilling fluid program protocols will be enforced, protocols follow.
- Cuttings samples will be collected by the drill crew on ten (10) foot intervals, unless lithology changes, or as directed by the client representative.
- Geophysical logging: spontaneous potential, single point and short/long normal resistivity, and spectral gamma ray. No other type of wireline sampling is anticipated.

For the well design/construction consider the following materials.

- 230, 480, and 680 feet of six (6)-inch nominal diameter blank casing, respectively. Casing will be constructed of either PVC (SDR120 or Schedule 80, depending upon depth; OR, 304 stainless steel). Casing to be flush-threaded, thread type and pattern to be suitable for joint yield strength at anticipated depth of setting.
- Twenty (20) feet of 6-inch nominal diameter, 0.020-inch slot well screen. Screen will be constructed of either PVC (slotted, SDR120 or Schedule 80, depending upon depth; OR, 304 stainless steel). Screen to be flush-threaded, thread type and pattern to be suitable for joint yield strength at anticipated depth of setting.
- Welding of 304 SS casing and screen will be considered as an option, based upon alignment quality control.

For the well development consider the following procedures.

- Eight (8) hours of swabbing, airlifting and bailing of the well. Drilling contractor should routinely monitor and record field parameters of pH, electrical conductivity and turbidity as additional means for assessing completeness of development. Assume that discharge from tanks will be to suitable location within 300 feet of drill site.
- Eight (8) hours of pump development. Drilling contractor should routinely monitor and record field parameters of pH, electrical conductivity and turbidity as additional means

for assessing completeness of development. Assume that discharge from tanks will be to suitable location within 300 feet of drill site

We will follow the drilling fluid program described below:

- The drilling fluid has a density (in pounds per gallon) of 8.8 to 9.4;
- The drilling fluid has a funnel viscosity (in seconds) of 36 to 45. Drilling fluid viscosity may be allowed to vary as borehole conditions dictate;
- The total solids content (by volume) of the drilling fluid shall be 6 to 8 percent;
- The sand content of the drilling fluid shall be no more than 2 to 4 percent;
- The A.P.I. water loss to the formation shall be no more than 10 to 12 percent;
- The mud cake wall thickness shall be no more than 3/32 of an inch;
- The Contractor shall use only N.S.F approved drilling fluid products, and shall use them according to the manufacturer's recommendations;
- The Contractor shall mix all products thoroughly, utilizing a mud hopper system or equivalent.

The Contractor shall provide sufficient above ground drilling fluid storage and solids control equipment such that:

- 30 minutes of surface retention time is provided for the recirculating drilling fluid, if desilters, desanders or shakers are not utilized; or
- 15 minutes of surface retention time is provided for the recirculating drilling fluid, if desilters, desanders and or shakers are utilized.

Our client will provide adequate space for on-site operations. Contractor must supply all materials, equipment and labor to complete the project. Cost estimates should be presented in standard units: feet, tons, hours, etc.

We will provide written specifications for the project, with which the successful bidder will be required to provide a final bid.

APPENDIX B

KCWA Monitoring Well Cost Assessment

Drilling and Well Material Costs

| Anticipated Well Depth | 250 | 500 | 700 |
|--|--------------|--------------|--------------|
| Direct Rotary Drilling/PVC Casing and Screen | \$42,587.50 | \$62,837.50 | \$79,037.50 |
| Direct Rotary Drilling/304 SS Casing and Screen | \$60,257.50 | \$98,757.50 | \$129,557.50 |
| Reverse Rotary Drilling/PVC Casing and Screen | \$94,637.50 | \$119,887.50 | \$140,087.50 |
| Reverse Rotary Drilling/304 SS Casing and Screen | \$112,307.50 | \$155,807.50 | \$190,807.50 |

Estimated Construction Observation Costs

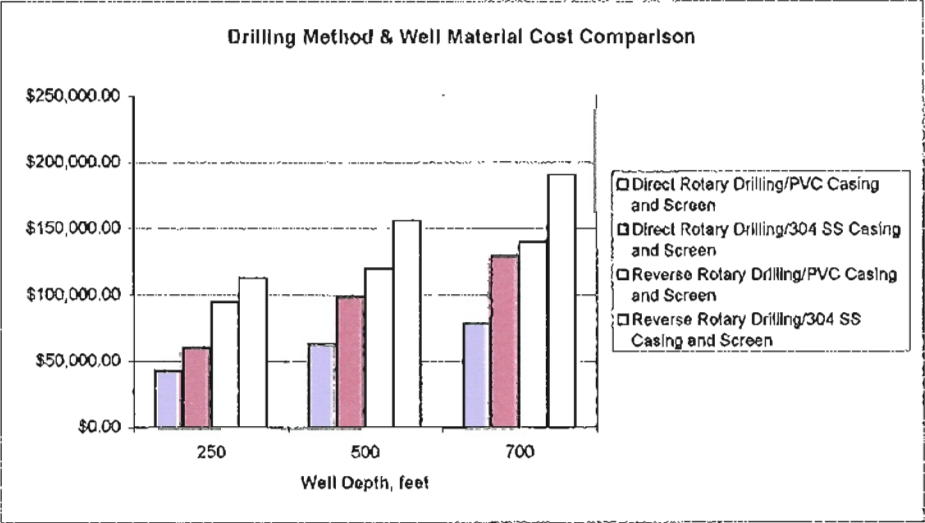
| | |
|--|----------|
| Design, Construction Observation, Hydrogeological Assistance | \$79,833 |
|--|----------|

Selected Drilling Method, Subtotal Costs

| | |
|--|--------------|
| Direct Rotary Drilling/PVC Casing and Screen - One 3 well site | \$184,462.50 |
| Direct Rotary Drilling/PVC Casing and Screen - 2 wells | \$85,175.00 |
| Direct Rotary Drilling/PVC Casing and Screen - 2 wells | \$125,675.00 |
| Direct Rotary Drilling/PVC Casing and Screen - 2 wells | \$158,075.00 |

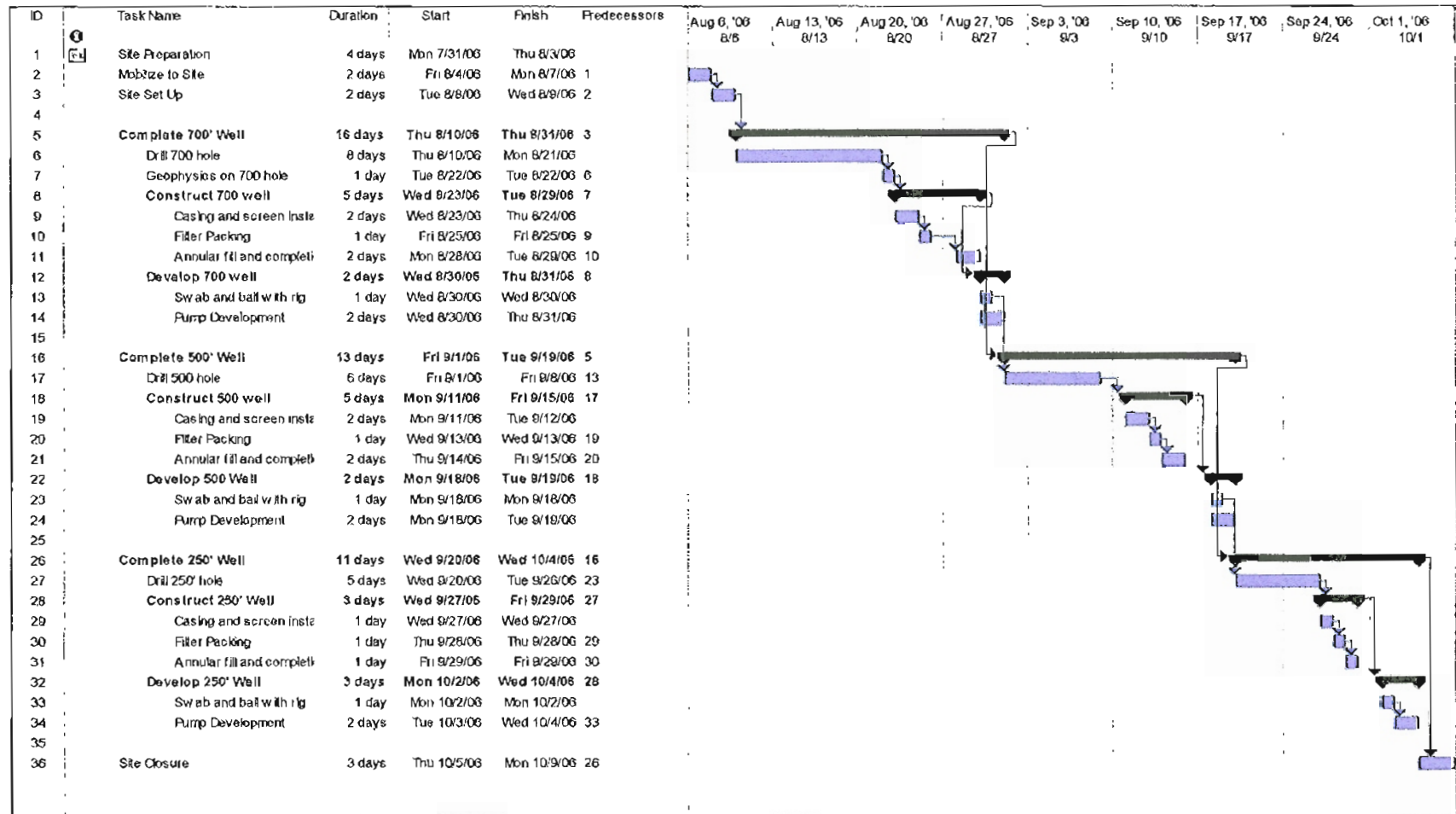
| | |
|--|--------------|
| Direct Rotary Drilling/PVC Casing and Screen - Six (6) wells | \$368,925.00 |
|--|--------------|

| | |
|---------------|--------------|
| Project Total | \$448,767.89 |
|---------------|--------------|



Drilling - Direct Rotary - PVC

| | 250 ft monitoring well | | | | 500 ft monitoring well | | | | 700 ft monitoring well | | | |
|---------------------------------|------------------------|----------|-------------|-------------|------------------------|----------|-------------|-------------|------------------------|----------|-------------|-------------|
| | Units | Est. Qty | Unit Price | Total | Units | Est. Qty | Unit Price | Total | Units | Est. Qty | Unit Price | Total |
| Mobilization | Each | 1 | \$11,000.00 | \$11,000.00 | Each | 1 | \$11,000.00 | \$11,000.00 | Each | 1 | \$11,000.00 | \$11,000.00 |
| Permits | Each | 2 | \$500.00 | \$1,000.00 | Each | 2 | \$500.00 | \$1,000.00 | Each | 2 | \$500.00 | \$1,000.00 |
| Test Hole | Linear Foot | 250 | \$69.00 | \$17,250.00 | Linear Foot | 500 | \$69.00 | \$34,500.00 | Linear Foot | 700 | \$69.00 | \$48,300.00 |
| Geophysical logging | Lump Sum | 1 | \$3,900.00 | \$3,900.00 | Lump Sum | 1 | \$3,900.00 | \$3,900.00 | Lump Sum | 1 | \$3,900.00 | \$3,900.00 |
| | | | | | | | | | | | | |
| F&I 6" nominal casing | Foot | 230 | \$12.00 | \$2,760.00 | Foot | 460 | \$12.00 | \$5,760.00 | Foot | 680 | \$12.00 | \$8,160.00 |
| F&I 6" nominal screen | Foot | 20 | \$21.00 | \$420.00 | Foot | 20 | \$21.00 | \$420.00 | Foot | 20 | \$21.00 | \$420.00 |
| F&I Filter Pack | Yard | 1 | \$430.00 | \$430.00 | Yard | 1 | \$430.00 | \$430.00 | Yard | 1 | \$430.00 | \$430.00 |
| Bentonite seals x 2/well | Foot | 20 | \$12.00 | \$240.00 | Foot | 20 | \$12.00 | \$240.00 | Foot | 20 | \$12.00 | \$240.00 |
| F&I Concrete sanitary seal | Yard | 2.5 | \$475.00 | \$1,187.50 | Yard | 2.5 | \$475.00 | \$1,187.50 | Yard | 2.5 | \$475.00 | \$1,187.50 |
| Air-lift development | Hour | 8 | \$200.00 | \$1,600.00 | Hour | 8 | \$200.00 | \$1,600.00 | Hour | 8 | \$200.00 | \$1,600.00 |
| Development Pump | Hour | 8 | \$200.00 | \$1,600.00 | Hour | 8 | \$200.00 | \$1,600.00 | Hour | 8 | \$200.00 | \$1,600.00 |
| | | | | | | | | | | | | |
| Concrete apron | Each | 1 | \$450.00 | \$450.00 | Each | 1 | \$450.00 | \$450.00 | Each | 1 | \$450.00 | \$450.00 |
| Standpipe Security and Bollards | Each | 1 | \$750.00 | \$750.00 | Each | 1 | \$750.00 | \$750.00 | Each | 1 | \$750.00 | \$750.00 |
| | | | | | | | | | | | | |
| Cuttings disposal | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| TOTAL | | | | 42587.5 | | | | 62837.5 | | | | 79037.5 |



Drilling - Reverse Rotary - PVC

| 250 ft monitoring well | | |
|------------------------|-------------|-------------|
| Est. Qty | Unit Price | Total |
| 1 | \$11,000.00 | \$11,000.00 |
| 2 | \$500.00 | \$1,000.00 |
| 250 | \$69.00 | \$17,250.00 |
| 1 | \$3,900.00 | \$3,900.00 |
| | | |
| 230 | \$85.00 | \$19,550.00 |
| 20 | \$65.00 | \$1,300.00 |
| 1 | \$430.00 | \$430.00 |
| 20 | \$12.00 | \$240.00 |
| 2.5 | \$475.00 | \$1,187.50 |
| 8 | \$200.00 | \$1,600.00 |
| 8 | \$200.00 | \$1,600.00 |
| | | |
| 1 | \$450.00 | \$450.00 |
| 1 | \$750.00 | \$750.00 |

| 600 ft monitoring well | | | |
|------------------------|----------|-------------|-------------|
| Units | Est. Qty | Unit Price | Total |
| Each | 1 | \$11,000.00 | \$11,000.00 |
| Each | 2 | \$500.00 | \$1,000.00 |
| Linear Foot | 500 | \$69.00 | \$34,500.00 |
| Lump Sum | 1 | \$3,900.00 | \$3,900.00 |
| | | | |
| Foot | 480 | \$12.00 | \$5,760.00 |
| Foot | 20 | \$21.00 | \$420.00 |
| Yard | 1 | \$430.00 | \$430.00 |
| Foot | 20 | \$12.00 | \$240.00 |
| Yard | 2.5 | \$475.00 | \$1,187.50 |
| Hour | 8 | \$200.00 | \$1,600.00 |
| Hour | 8 | \$200.00 | \$1,600.00 |
| | | | |
| Each | 1 | \$450.00 | \$450.00 |
| Each | 1 | \$750.00 | \$750.00 |

Mobilization
Permits
Conductor casing
Test Hole
Geophysical logging

F&I 6" nominal casing
F&I 6" nominal screen
F&I Filter Pack
Bentonite seals x 2/well
F&I Concrete sanitary seal
Air-lift development
Development Pump

Concrete apron
Standpipe Security and Bollards

Cuttings disposal

| 250 ft monitoring well | | | |
|------------------------|----------|-------------|-------------|
| Units | Est. Qty | Unit Price | Total |
| Each | 1 | \$45,000.00 | \$45,000.00 |
| Each | 2 | \$500.00 | \$1,000.00 |
| Linear Foot | 50 | \$350.00 | \$17,500.00 |
| Linear Foot | 200 | \$89.00 | \$17,800.00 |
| Lump Sum | 1 | \$3,900.00 | \$3,900.00 |
| | | | |
| Foot | 230 | \$12.00 | \$2,760.00 |
| Foot | 20 | \$21.00 | \$420.00 |
| Yard | 1 | \$430.00 | \$430.00 |
| Foot | 20 | \$12.00 | \$240.00 |
| Yard | 2.5 | \$475.00 | \$1,187.50 |
| Hour | 8 | \$200.00 | \$1,600.00 |
| Hour | 8 | \$200.00 | \$1,600.00 |
| | | | |
| Each | 1 | \$450.00 | \$450.00 |
| Each | 1 | \$750.00 | \$750.00 |

| 600 ft monitoring well | | | |
|------------------------|----------|-------------|-------------|
| Units | Est. Qty | Unit Price | Total |
| Each | 1 | \$45,000.00 | \$45,000.00 |
| Each | 2 | \$500.00 | \$1,000.00 |
| Linear foot | 50 | \$350.00 | \$17,500.00 |
| Linear Foot | 450 | \$89.00 | \$40,050.00 |
| Lump Sum | 1 | \$3,900.00 | \$3,900.00 |
| | | | |
| Foot | 480 | \$12.00 | \$5,760.00 |
| Foot | 20 | \$21.00 | \$420.00 |
| Yard | 1 | \$430.00 | \$430.00 |
| Foot | 20 | \$12.00 | \$240.00 |
| Yard | 2.5 | \$475.00 | \$1,187.50 |
| Hour | 8 | \$200.00 | \$1,600.00 |
| Hour | 8 | \$200.00 | \$1,600.00 |
| | | | |
| Each | 1 | \$450.00 | \$450.00 |
| Each | 1 | \$750.00 | \$750.00 |

| 700 ft monitoring well | | | |
|------------------------|----------|-------------|-------------|
| Units | Est. Qty | Unit Price | Total |
| Each | 1 | \$45,000.00 | \$45,000.00 |
| Each | 2 | \$500.00 | \$1,000.00 |
| Linear foot | 50 | \$350.00 | \$17,500.00 |
| Linear Foot | 650 | \$89.00 | \$57,850.00 |
| Lump Sum | 1 | \$3,900.00 | \$3,900.00 |
| | | | |
| Foot | 680 | \$12.00 | \$8,160.00 |
| Foot | 20 | \$21.00 | \$420.00 |
| Yard | 1 | \$430.00 | \$430.00 |
| Foot | 20 | \$12.00 | \$240.00 |
| Yard | 2.5 | \$475.00 | \$1,187.50 |
| Hour | 8 | \$200.00 | \$1,600.00 |
| Hour | 8 | \$200.00 | \$1,600.00 |
| | | | |
| Each | 1 | \$450.00 | \$450.00 |
| Each | 1 | \$750.00 | \$750.00 |

\$60,257.50

TOTAL

\$94,637.50

\$119,887.50

\$140,087.50

Kern County Water Agency Consultant Contract Summary

Dee Jaspar & Associates
Various Engineering Services
for
Improvement District No. 4

Pay Estimate No. 23

Consultant: Dee Jaspar & Associates
3701 Pegasus Drive, Ste. 121
Bakersfield, CA 93308

Date: December 7, 2007

DJA Job No.: K0300207, K0300706, K0301006, K0300906

K0300906B, K0300507

Account Number: 470C-5602-47051

Approval Summary:

| Item No. | Description | Approval Date | Amount | Budget Summary |
|----------|---|---------------|-------------|----------------|
| 1 | Engage Consultants for Engineering Services | 9/27/2006 | 60,000.00 | |
| 2 | Subtotal | | \$60,000.00 | |
| | Less Payments to Date | | | \$22,833.26 |
| | Budget Remaining | | | \$37,166.74 |

Invoice Summary:

| Contract Earnings To Date | | Invoice No. | Invoice Date | Previous Payments | Current Payment | Total Payment |
|---------------------------|----------------|-------------|--------------|-------------------|-----------------|---------------|
| Precipitated Solids- | Invoice No. 1 | 06-10061 | 10/31/06 | 4,237.00 | 0.00 | 4,237.00 |
| Precipitated Solids- | Invoice No. 2 | 06-11022 | 11/30/06 | 815.76 | 0.00 | 815.76 |
| ID4 Monitor Wells | Invoice No. 3 | 06-11025 | 11/30/06 | 564.06 | 0.00 | 564.06 |
| ID4 Trees | Invoice No. 4 | 06-11024 | 11/30/06 | 927.00 | 0.00 | 927.00 |
| General | Invoice No. 5 | 06-11026 | 11/30/06 | 143.00 | 0.00 | 143.00 |
| ID4 Trees | Invoice No. 6 | 06-12027 | 12/31/06 | 309.00 | 0.00 | 309.00 |
| ID4 Monitor Wells | Invoice No. 7 | 06-12025 | 12/31/06 | 103.00 | 0.00 | 103.00 |
| Precipitated Solids- | Invoice No. 8 | 07-01021 | 01/31/07 | 772.50 | 0.00 | 772.50 |
| ID4 Trees | Invoice No. 9 | 07-01023 | 01/31/07 | 940.25 | 0.00 | 940.25 |
| ID4 Monitor Wells | Invoice No. 10 | 07-02020 | 02/28/07 | 110.00 | 0.00 | 110.00 |
| General | Invoice No. 11 | 07-03031 | 03/31/07 | 3.76 | 0.00 | 3.76 |
| Hillcrest Well | Invoice No. 12 | 07-03024 | 03/31/07 | 110.00 | 0.00 | 110.00 |
| Hillcrest Well | Invoice No. 13 | 07-04026 | 04/30/07 | 1,796.91 | 0.00 | 1,796.91 |
| ID4 Monitor Wells | Invoice No. 14 | 07-05022 | 05/31/07 | 55.00 | 0.00 | 55.00 |
| ID4 Monitor Wells | Invoice No. 15 | 07-06020 | 06/30/07 | 110.00 | 0.00 | 110.00 |
| ID4 Trees | Invoice No. 16 | 07-06019 | 06/30/07 | 110.00 | 0.00 | 110.00 |
| ID4 Monitor Wells | Invoice No. 17 | 07-07025 | 07/31/07 | 1,090.00 | 0.00 | 1,090.00 |
| ID4 Trees | Invoice No. 18 | 07-07024 | 07/31/07 | 4,170.00 | 0.00 | 4,170.00 |
| ID4 Property Acq. | Invoice No. 19 | 07-07022 | 07/31/07 | 330.00 | 0.00 | 330.00 |
| ID4 Property Acq. | Invoice No. 20 | 07-08020 | 08/31/07 | 2,333.59 | 0.00 | 2,333.59 |
| ID4 Trees | Invoice No. 21 | 07-08022 | 08/31/07 | 1,014.00 | 0.00 | 1,014.00 |
| ID4 Monitor Wells | Invoice No. 22 | 07-09021 | 09/30/07 | 2,678.43 | 0.00 | 2,678.43 |
| ID4 Trees | Invoice No. 23 | 07-09020 | 09/30/07 | | 110.00 | 110.00 |
| Subtotal | | | | \$22,723.26 | \$110.00 | \$22,833.26 |
| Less Previous Payments | | | | | | 22,723.26 |
| Amount Due | | | | | | \$110.00 |

Signatures:

Submitted By:

Engineering and Groundwater Manager

General Manager

ID4 Manager

Construction of Monitoring Wells Within ID4 Kleinfelder

Consultant: Kleinfelder
5880 District Blvd
Suite 24
Bakersfield, CA 93313

Account Number: 460D-5604-46002

| Item No. | Description | Approval Date | Amount | Budget Summary |
|----------|---|---------------|-------------|----------------|
| 1 | Assist staff in construction of monitoring wells within ID4 | 4/26/2006 | 40,000.00 | |
| | Subtotal | | \$40,000.00 | |
| | Less Payments to Date | | | \$11,315.71 |
| | Budget Remaining | | | \$28,684.29 |

[illegible]

Submitted By:

General Manager

mvarga
12/7/2007, KF Pay Estimate 5.xls